

Hobbies

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SUPPLEMENT DESIGN FOR MODEL OF THE CORONATION CHAIR

Patterns for an electrically-operated model TRAFFIC INDICATOR

THIS should make an interesting model both for home amusement and exhibitional purposes. A switch is added to control the lighting sequence, and the changing of the lights is fascinating to watch. It is not a difficult model to construct, but some care is necessary when wiring the lamps.

Most of the parts are shown full size on the pattern page. For a start cut four of A from $\frac{1}{8}$ in. wood. Bore the holes through, and in two, at the bottom, make a saw kerf $\frac{1}{16}$ in. deep. In the other two make the saw kerfs at the top. On the right-hand edge bore small holes with a bradawl, where shown by the dotted lines, about half-way through for the screw contacts.

Contacts

Cut parts B and C from $\frac{1}{8}$ in. wood, then two of parts D to the full dimensions from $\frac{1}{8}$ in. wood, and two to the narrower dimensions down by the dotted lines. In parts A drive $\frac{1}{16}$ in. round-headed screws in the side holes. For the stud contacts cut from thin sheet metal 12 of part E, and bend as at F. These are screwed to parts A, left-hand edges, so that the bent portion will come over the holes, as in the detail F.

These four parts, which contain the lamp bulbs, are nailed to top piece C and bottom piece B. Note their position is a little out of centre, as indicated by the dotted outline on both B and C. The diagram, Fig. 1, gives a good idea of the lamp box, as we can now call it. The parts D are now screwed to cover the sides of this lamp box, as the horizontal section will make clear, in Fig. 2. Be sure to make up with close fitting joints,

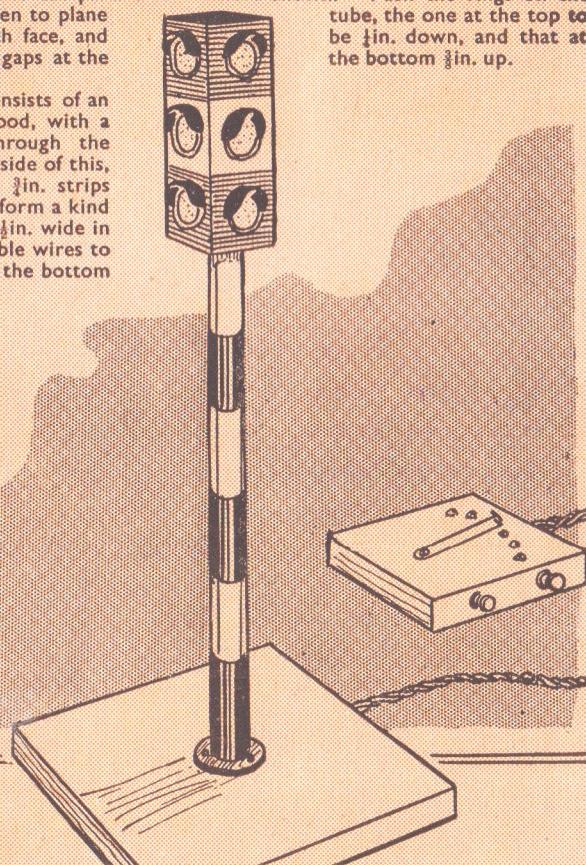
an important point as regards the subsequent appearance of the model. It would be a good plan to cut parts D a little full in width, then to plane their edges to fit each face, and so leave no awkward gaps at the corners.

The base, Fig. 4, consists of an 8in. square of $\frac{1}{8}$ in. wood, with a $\frac{1}{8}$ in. hole bored through the centre. To the underside of this, glue and nail $\frac{1}{8}$ in. by $\frac{1}{8}$ in. strips of wood all round to form a kind of rim, leaving a gap $\frac{1}{16}$ in. wide in one side for the flexible wires to emerge. Cover in at the bottom with another 8in. square of wood, screwed on for easy removal afterwards.

At about the position shown in the drawing, screw five lengths of thin brass, 1in. long, for connections.

The pillar of the model is a 12in. length of $\frac{1}{8}$ in. diameter metal tubing. Brass would be suitable for this and if possible choose a thin walled tubing to allow as much space as possible inside for wiring. For fixing this tubing to base and lamp box, cut from $\frac{1}{16}$ in. metal two discs, as at G on the pattern page, and bore or cut out

central holes $\frac{1}{16}$ in. as a tight fit over the tube. Also drill suitable screw holes where shown. Push the rings on the tube, the one at the top to be $\frac{1}{16}$ in. down, and that at the bottom $\frac{1}{16}$ in. up.



Here the rings are soldered to the tube. Be generous with the solder, so that a good fillet of it is worked on. Any roughness or unevenness is levelled off with a file. Screw to the base, as in Fig. 3, and similarly to the bottom of the lamp box.

Painting

Now glasspaper all the outside wooden parts of the model. The sharp corner edges of the base, and top of the lamp box are rubbed off, but not too much. The whole can then be enamelled, the base white, pillar in bands of white and black, and lamp box black at top and bottom, with white at the middle. Now leave for the enamel to set, then remove the side parts D and unscrew the box from the tube for the wiring operation, an interesting and rather touchy business, requiring the instructions to be carefully followed to avoid annoying mistakes.

For the lamps, 12 2·5 volt bulbs will be required, of the kind fitted to the small torches. Press these lamps in the holes in posts A and tighten the side screws to contact them. Also see that the bottom stud of each presses against the brass parts E. Obtain a length of bare copper wire and wind the end of it tightly round a bottom contact screw, then up and round the middle and top screw. Carry the wire across the next post A, pressing it in the saw kerf, then twist it round the three screws, and so on until the wire connects every screw contact of the 12.

Testing

It will be convenient if, when fitting posts A to the top and bottom, to arrange them so that a bottom saw kerf comes next to a top saw kerf, then the wire can cut across each post at the nearest point to its last contact screw. Cut off surplus wire at the last screw, leaving just $\frac{1}{8}$ in. To this twist the end of a length of D.C.C. wire, and pass the latter between the posts and through the hole in the bottom of the lamp box.

A test should now be made to see if all lamps are properly contacted so far. Connect the wire from the screw contacts to a terminal of a 3 volt battery, then with a wire twisted round the other terminal, touch each of the brass stud contacts in turn. Each lamp should light, if the contacts, screw and stud, are functioning alright.

For the second wiring, note the order of the colours, shown in Fig. 6. To lessen chance of error, it would, perhaps, be wise to letter the posts where the lamps come, red, amber and green. To the red light connect a double wire, making two leads, by either twisting the bared ends round the stud contact (that piece below the fixing screw), or soldering it to it.

Pass it between the posts and through the hole in the bottom of the lamp box. To the green light connect one lead similarly, and to the amber one, two leads. To the ends of these wires, gum slips of paper, denoting which lamps they connect.

To facilitate this it will be as well to mark each face N., S., E. and W. re-

spectively. On the slips mark the leads N. red 1, N. red 2, N. amber 1, N. amber 2, N. green. When all the lamps are connected, push the bunch of wires

MATERIALS NEEDED

For this model the following panels will be enough: H.4—one; G.2—one; softwood, G.D.6—three. A spare piece of boxwood or plywood can be used for covering the base at its bottom.
18· $\frac{1}{2}$ in. round-headed screws.
24· $\frac{1}{2}$ in. flat-headed screws.
48· $\frac{1}{2}$ in. round-headed screws.
2 brass terminals. 1ft. $\frac{1}{2}$ in. diameter metal tube. 1ft. $\frac{1}{2}$ in. brass sheet, 1· $\frac{1}{2}$ ins. by 3ins. Small piece of thin brass sheet for contacts and switch.

through the tube, removing the bottom of the base first.

These wires must now be soldered to the brass contacts already fixed there, and numbered 1 to 5. It is as well to add that as several wires have to be twisted together, a not too stout gauge of wire is advisable. No. 24 D.C.C. would do.

The Wiring

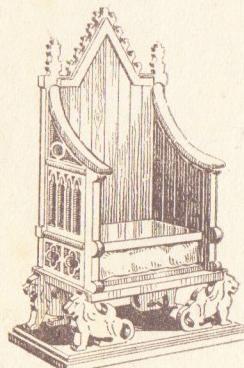
Firstly, take the single wire, leading from the screw contacts, and solder this to contact 5. Now observe the following order, after sorting the wires out.

Take wires N. and S. red, E. and W. green (four leads), twist the ends and solder to contact 1. For the second signal, N. and S. red, N. and S. amber, E. and W. amber. These to contact 2. For the third signal, N. and S. green, E. and W. red. These to contact 3. For the fourth signal, N. and S. amber, E. and W. red and amber. It will be noted that there are six leads to signal 2 and 4, and four leads to the others. It all sounds more complicated than it really is. When connected, test the lamps again with the battery.

For the flex connection from model to switch, cut five lengths of single flex, as

A Model of the Coronation Chair

For making this historic model patterns are given on our free design sheet. A kit of wood, No. 2872, is supplied by Hobbies Branches and stockists for 3/11 or by post from Hobbies Ltd., Dereham, Norfolk for 4/9.



long as the connection required. Solder the ends to the brass contacts in the base, and to help identifying them afterwards, label them respectively 1 to 5, corresponding to the contact they are soldered to. Now twist the cords together or plait them as preferred.

It will be advisable now to test again with the battery, it only takes a minute, and if an error is made it points it out and saves time later on. Connect cord 5 to the battery and see that when the other cords contact the remaining terminal, the correct lamps light up.

Light Hoods

Before replacing the lamp box covers D, cut from $\frac{1}{8}$ in. fretwood 12 of parts H for the spectacle rims, and 12 of parts I from tinplate, for the hoods. The latter are enamelled black, and the spectacle rims white or black, to match the covers. Bore three screw holes in each rim where shown to pass $\frac{1}{8}$ in. round-headed screws.

For the coloured spectacles, as glass will probably be out of the question, thin coloured plastic could be substituted or coloured paper. The last would be the easiest method, and should be covered with mica.

Any difficulty about the mica can be solved by purchasing one or two mica windows, as used in oil stores from the hardware stores. Cut both into $1\frac{1}{2}$ in. squares and fix behind the rims with a touch of glue, then trim with scissors to the edge of the rims. Bend the hoods to the curve of the rims and screw both rims and hoods to the covers, one screw at the top entering both rim and hood. The two side lugs on the hood will come behind the rim lower down and the remaining two screws to each will secure. Now refix the covers to the lamp box.

Switchboard

The switchboard, the last part to make, is shown at Fig. 5. It is a rectangle of $\frac{1}{8}$ in. wood, with rim pieces of $\frac{1}{8}$ in. wood round, underneath, with a bottom cover of $\frac{1}{8}$ in. wood, screwed on. At 1in. from the bottom end make a mark and from there, with a radius of 2ins., strike an arc. On this arc, at $\frac{1}{8}$ in. centres, drive six $\frac{1}{8}$ in. round-headed screws. Turn over and file the projecting points of the screws down to leave flats to which the flex leads can be soldered.

For the switch, cut a $\frac{1}{8}$ in. strip of brass to a length of $2\frac{1}{2}$ ins. long. Drill a hole at one end, and make a small hole through the wood for the switch screw, a $\frac{1}{8}$ in. round-headed brass one. Place a washer under the switch and one above, push the screw through the lot and drive through the wood. The far end of the switch can be turned up a little. Run a file over the screw studs to render them all level. In the side of the switchboard fit a pair of brass terminals for connection to the dry battery.

Cut a channel through the rim of the board for the flex leads to enter, then solder leads 1 to 4, to the studs, leaving the end ones as 'dead' points. Lead 5 is

(Continued on page 109)

Any youngster would be delighted to have this
CHILD'S PULL-ALONG CAR

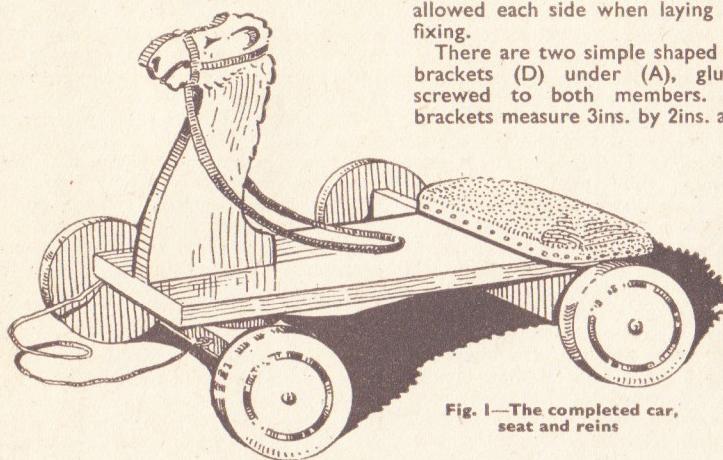


Fig. I—The completed car, seat and reins

WE show on this page a splendid little runabout car for the quite young baby or youngster. We call it the 'Camel Car' because, as will be seen from Fig. 1, it has a realistic figure-head of the camel. The car can be used as a pull-along toy, with baby sitting on the padded seat and the big brother to pull it along.

A plan of the toy is given in Fig. 1, and some measurements are included which will help in the assembly. In Fig. 3 we see a side view showing the position of the various pieces in conjunction with the plan view. The piece (A), forming as it were the foundation piece, will first be marked and cut. It is a plain oblong measuring 16ins. by 4ins. by $\frac{1}{2}$ in. thick, and at the front end a mortise will be cut in it 2 $\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide to take the head of the camel.

The next piece to cut will be piece (B), and this measures 6ins. by 5ins.; two corners will be trimmed away, as shown in the plan Fig. 2. This piece may be of either $\frac{1}{2}$ in. or $\frac{3}{8}$ in. stuff, and is glued and screwed to the end of piece (A).

The axle piece (C) is another plain oblong 10ins. long by 3ins. wide and this should not be thinner than $\frac{3}{8}$ in., as it has to take the wheels. It would be a good plan to nail or screw this piece (C) to the platform (A) before piece (B) is fixed, and see to it that an equal width of 3ins. is

allowed each side when laying out and fixing.

There are two simple shaped support brackets (D) under (A), glued and screwed to both members. These brackets measure 3ins. by 2ins. and have

Fig. 6. Board (F) measures 7ins. by 3ins. by $\frac{1}{8}$ in. thick, and screwed and glued to this is the axle board (G) measuring 7ins. by 3ins. by $\frac{1}{8}$ in.

To stiffen the fixing of the latter, two brackets (H) are put on, one either side of (G), as seen in the detail Fig. 6. The brackets are cut from wood measuring 2ins. by 1in.

The task of making the camel's head can now be undertaken, and a board of $\frac{3}{4}$ in. thick wood will be wanted measuring 9ins. long by 5ins. wide. On this board set out the 1in. squares shown in Fig. 7, and draw in the outline of the head and neck, keeping strictly to the guide lines in the illustration.

Use a coarse fretsaw blade for the cutting, and keep strictly to the drawn line. Keep well to the outside of the drawn lines when cutting the tenon, so as to ensure a good fit when it is glued into the mortise. See that the tenon and the flat surfaces each side of it fit properly before actually making the glued joint. Two strong screw eyes should be run into the front edge of piece (F) to take the cord for pulling the car along.

The wheels may be obtained already finished and painted and bored ready for fixing from Hobbies Ltd. They are 4 ins. in diameter and the round-head screws with washers are supplied with the wheels.

Before the wheels are put on, however, the car should be nicely painted up in bright colours. Two coats of paint should first be put on as a filler for the grain, a light rubbing with fine glass-paper being given between each successive coat. The finishing coat should be enamel of any chosen colour. The markings of the camel's head should be put in in black or brown to show up well on the ground colour.

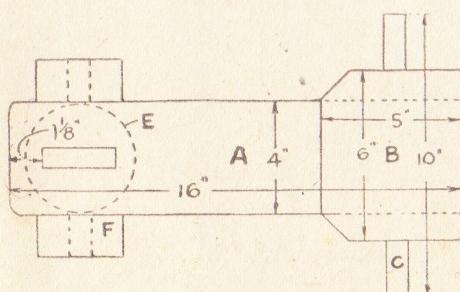


Fig. 2—Plan of platform and axles

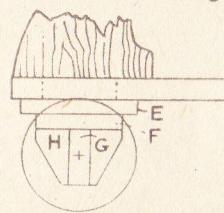


Fig. 3—Side view of undercarriage parts.

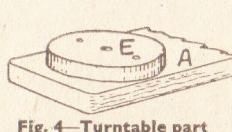


Fig. 4—Turntable part

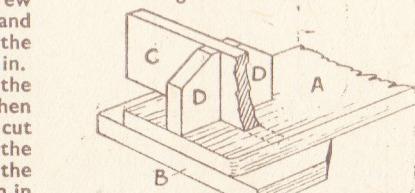


Fig. 5—Support brackets



Fig. 7—The head shape

Some useful and simple everyday articles to make in WOODTURNING

NEW tool handles are often required in the workshop, and these are easily produced on the lathe. There are two main types of handle, one intended for saw-files bradawls, etc., and the second for chisels and similar tools. An identical method of working is used for both types.

Handle Turning

A piece of ash 6ins. to 8ins. long according to requirements, and about 1in. square, is turned to a cylindrical shape. The edge shaping is roughed out with the gouge and finally smoothed with the chisel. The parting tool is used to cut into the thickness where the diameter is to be reduced for the brass ferrule, and in the case of the chisel handle three lines can be put round the body with the same tool. The thinning down at the ferrule end and the half-round shaping at the end of the file handle is done with the chisel. Figure 1 shows the two types of handle.

A handle of much the same type as that used for a file may also be used for a rolling pin (Fig. 2). In this case, however, a fairly long projecting dowel is

dimensions have been given as these will vary according to requirements, but the proportions are approximately correct. In both cases the work is started by first reducing the wood to a cylindrical shape from a point 4ins. from the top down to the bottom of the leg. The parting chisel is then used to cut in the depth lines, the wood is reduced between them as necessary, and the final shaping is done with gouge, chisel and scraper; the drawing shows the appearance of the leg after the preliminary cutting in stage.

Much time and trouble can be saved in lathework by working 'in duplicate' whenever this is possible. For instance, in making a set of wheels these could all be cut and shaped up at the same time, being separated, when finished, by the parting tool (Fig. 4a). Similarly, the door-knobs shown in Fig. 4b could be made as a pair with a long connecting dowel.

Light Standards

Two turned items that are in constant demand are the lamp standard and candlestick. These can be cut out of the solid, but the method is very wasteful of material. The normal procedure is

wooden face. A layer of newspaper between the two pieces of wood will allow of their being easily separated when the finished item is to be removed from the lathe.

The process of face-plate turning is quite simple. The work is first reduced to its outside shape, then the tool-rest is turned at right-angles so that the inside may be cut away. When doing this last operation the cutting is started from the outside and runs towards the centre, using the gouge or chisels as necessary.

Serviette Rings

For a first attempt at this form of work a serviette ring could be made (Fig. 6). Here a 2in. long piece of wood is reduced to 2in. diameter, then grooves $\frac{1}{4}$ in. wide and deep are worked on the two ends (Fig. 6a). With the chisel the projecting rim is half-rounded and a couple of scribed lines are made round the centre of the rim (Fig. 6b). The tool-rest is then turned at right-angles and the inside is hollowed out to within $\frac{1}{8}$ in. of the outside edges. Fig. 6c gives an end elevation of the finished ring.

An even simpler piece of work would be to turn the lamp standard base to the



Fig. 1—Two tool handles

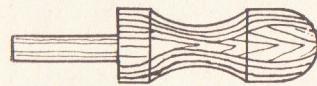


Fig. 2—Rolling pin handle

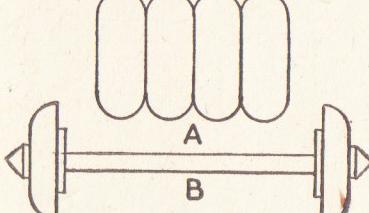


Fig. 4—Wheels and door knobs

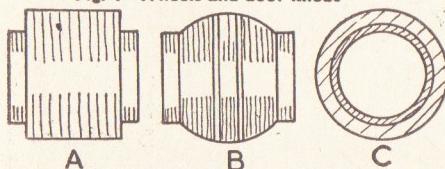


Fig. 6—Styles for serviette rings

left at the end of the handle so that it may be glued into a hole bored in the end-grain of the cylindrical roller.

Legs for small occasional tables give plenty of scope for good craftsmanship. Fig. 3 shows two types of leg that may be turned quite easily. No specific

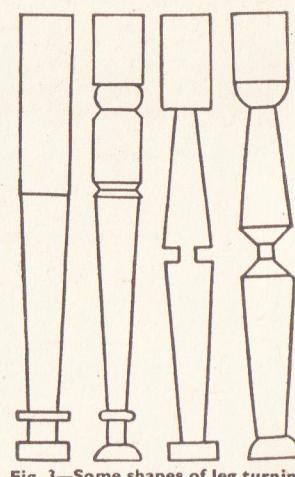


Fig. 3—Some shapes of leg turning

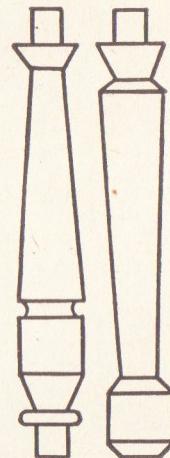


Fig. 5—Lamp standards

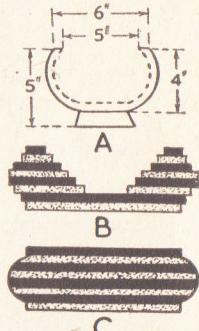


Fig. 6—Serviette rings

to turn the base separately on a face-plate (see below), leaving a dowel at the bottom of the column to fit into the base. Two simple columns are shown in Fig. 5.

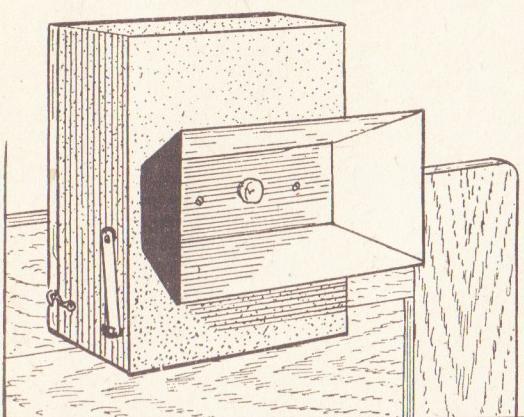
So far only turning 'between centres' has been considered, but for thin work of large diameter (e.g. lamp standard bases) or hollowed work like bowls, the face-plate must be used.

For this, a metal face-plate is necessary, usually tapered so it fits into the headstock spindle. A temporary wooden face is screwed to the face-plate from the back, and the block to be turned is glued (or sometimes screwed) to the

shape shown at Fig. 7. When any considerable depth of hollowing out has to be done, the chisel may project long way beyond the tool-rest, and it then becomes awkward to handle, being very liable to slip and disfigure the turned work. To overcome this a 'rest' is used. This is a long piece of metal having a short right-angle bend at the bottom and fitted with a chisel handle at the top. In use, this handle is held under the armpit while

(Continued foot of page 104)

Made complete with reflector and rail clip is this BATTERY BED LAMP



READERS who enjoy reading in bed, and cannot fit the usual type of electric lamp owing to the absence of house current, could make the lamp illustrated, which employs a dry battery. Naturally, there is not the same volume of light, but by concentrating the beam on to the book there is enough to read by. A cycle lamp battery, which has a comparatively long life, supplies the current, and provided the light is not stretched unduly, will last a reasonable while.

Wooden Case

The case is made of $\frac{1}{2}$ in. thick fretwood, except the front, which needs $\frac{3}{8}$ in. thick wood. The wood parts of the case are grouped together in Fig. 1. The front (A) is, as mentioned, cut from $\frac{3}{8}$ in. wood to dimensions given. Centre it and there bore a $\frac{1}{2}$ in. hole through for the lamp. Cut the front across, on the line, to make two parts. Making a small hole first, drive a $\frac{1}{2}$ in. thin brass screw into the cut edge, it should enter the hole and make contact with the lamp when the latter is in place.

Opposite this, on the edge of the smaller piece, saw out a semi-circular piece, as shown by the dotted lines. To the protruding edge of the screw head twist a few inches of copper wire, as in detail (D) in Fig. 2, for connection.

The back of the box is cut the same size as the front, but of $\frac{1}{2}$ in. wood. Now cut two sides to dimension at (B). On

easier grasping. Turn the wood round, and file the protruding tips of the screws a little. To those belonging to switch, and bottom right contact screw, solder lengths of copper wire for connections, as at (E).

The ends of the box (C) are now cut. To the one that will be the top of the box, find the centre on the underneath surface, and there drive, partly in, a $\frac{1}{2}$ in. round-headed screw, to make contact with the top terminal of the battery.

To this screw another length of copper wire is attached, as at (F). Glue and nail the sides and ends of the box together. The back is hinged at the top, and a pair of hook and eye fasteners are fitted, near the bottom, to keep the back closed.

Wiring

The larger portion of the front of the box is fitted on, then the connections can be made. No separate diagram is really needed here. The wire from the lamp hole is joined to the wire leading from the switch arm, and the wire from the bottom switch stud to that attached to the screw in the top of the box. Use D.C.C. or enamelled wire, for connections and have those portions of the wires soldered to the screws, or twisted together. Tuck the wires inside the box neatly to not impede the placing of the dry battery. Now test.

Screw a lamp in the lamp hole and see the screw, driven in the edge, contacts it efficiently. Place a battery in the box and take note that the terminals of it contact

what will be the left side, a switch arrangement is to be fitted. First, at $\frac{1}{2}$ in. from the bottom drive in two $\frac{1}{2}$ in. round-headed brass screws, $\frac{1}{2}$ in. apart, and where shown in the diagram. Above these make a small hole for the switch screw.

The switch is a piece of $\frac{1}{2}$ in. wide springy brass strip, as at (E) in Fig. 2. Bore a hole for the screw near the top of it, then fix to the box with the screw, putting a brass washer under the switch first. The end of the switch arm can be curled up a little for

the screw at the top and the tip of the lamp in front. Now switch the arm to the right stud, and if all is O.K., the lamp will light up. If it does not, in all probability the terminals are not contacting properly and should be separately tested. When all is right, screw the other part of the front on. Remove the battery, then varnish or paint, as preferred, the box.

The Reflector

The reflector, Fig. 3, is made from a suitably sized piece of bright tin plate. The pattern is drawn over $\frac{1}{2}$ in. squares. and these squares should be copied full size on to thin white paper and the shape carefully pencilled on. Note the narrow laps at top and bottom wings. These are for soldering the reflector when shaped up.

Gum the pattern to the tin, and then cut out the shape. Turn over the laps and cut out a hole in the centre, large enough to fit over the lamp. Two smaller holes are punched through, either side of the lamp hole, for the fixing screws. Soak the tin in warm water to remove the pattern, and then dry it. Bend up the wings to 45 degrees angle, and solder the corner joints.

If the cut edges at the front are objected to, when cutting the shape allow an extra $\frac{1}{2}$ in. to the outer edges of the wings, and when the reflector is soldered to shape, turn over these extra $\frac{1}{2}$ in. and hammer down on the outside.

Paint and Polish

Give the outside of the reflector a coat of black enamel, then fix to the front of the box with a couple of $\frac{1}{2}$ in. round-headed screws. Polish up the inside surface with a metal polish, making it as bright as possible.

If the lamp is to be fitted to one of the wood frame bedsteads, a simple metal clip, as at (G) in Fig. 4 will suffice. It can be bent up from stiffish brass or aluminium strip, and be screwed to the back of the box. Bend it to suit the thickness of wood of the bed-head.

An iron bedstead requires something different, obviously, so a fastener of the pattern shown at (H) will probably suit

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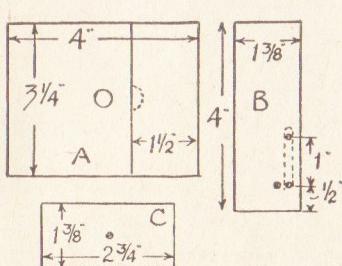


Fig. 1—The wooden case parts

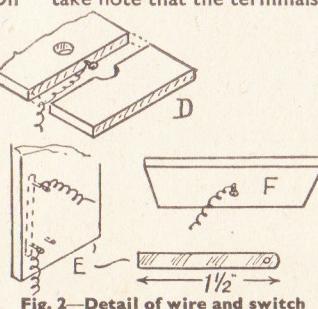


Fig. 2—Detail of wire and switch

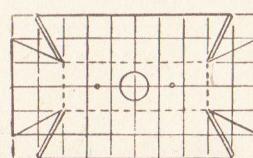


Fig. 3—Reflector shape

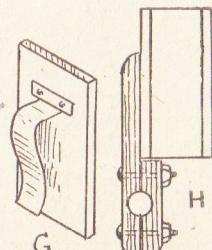


Fig. 4—Rail fixing and clip

Some additional notes for photographers— ENLARGER HINTS

OUR article on the making of a fixed-focus photographic enlarger in our issue of August 30th has attracted a good deal of interest, and many readers have written in for further details, chiefly in connection with a lens of a different focus to that mentioned, or for taking, say, $2\frac{1}{4}$ in. square negatives instead of the usual rectangular '120' size.

The following additional notes will, therefore, be of interest. Regarding the lens, apart from using a watchmaker's eyeglass of $5\frac{1}{2}$ ins. or any other focus, the lens from an old camera may be used. At junk stores and on street market stalls one often sees cameras of 1910-ish vintage. This is with spool and plate-holding arrangements quite out of place for modern needs but having the lens intact even if the shutter mechanism has failed.

Such cameras can be obtained very cheaply merely for the lens. The camera should be taken to pieces carefully, particular note being taken of the distance from lens to surface of plate or film. Keep the lens in its original setting, on the front board.

Proportionate Enlargements

For proportion of negative to enlargement, such sizes as $2\frac{1}{4}$ ins. by $3\frac{1}{4}$ ins. are directly related to $\frac{1}{4}$ -plate sizes and, more or less, to a postcard size. In other words, the whole of a small negative will more or less exactly cover a larger size sheet of the size just mentioned.

Where the not-unusual $2\frac{1}{4}$ ins. square size is concerned, the best proposition is to construct the enlarger to take square enlargements. A size $4\frac{1}{4}$ ins. square will be quite sufficient for most people, and $3\frac{1}{2}$ ins. square may be better. With a fixed-focus enlarger of this type, the practice of making, say, $\frac{1}{4}$ -plate enlargements from rectangular portions of a $2\frac{1}{4}$ ins. square negative is not really possible.

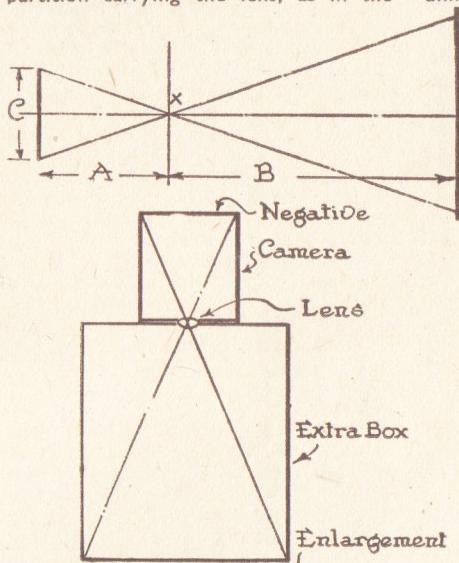
To vary dimensions, draw, on a sheet of paper very accurately, a diagram, as shown. First set up a line to represent the negative, (C) representing the longest way of the negative. From its centre, a horizontal line is drawn. Along this, set off distance (A). This will be known, as it is the focal length of the lens.

From the ends of (C) draw lines through point (X). Within this 'wedge', so to speak, set off distance (B) (found by trial and error) where (D) will represent the long way of the enlargement. The whole problem may be worked out quite easily by mathematics but we do not assume that all readers have this knowledge.

Alternative Use of Old Camera

Instead of taking an old camera to pieces it can be built into the enlarger. This is shown diagrammatically and without constructional details (which a handyman can work out for himself) in the appended sketch.

What it amounts to is that instead of there being one long box with a centre partition carrying the lens, as in the



original model, we now have two separate compartments, one being the camera and the other being a plywood, light-tight box, fixed firmly and permanently together. The negative and the paper holders can be designed from instructions already given in the original article, whilst distances can be worked out from notes just given.

Illumination

For winter evening work where the use of daylight is out of the question,

electric light may be used. Obtain, if possible, a piece of flashed opal glass. Failing this, get two pieces of ground glass and separate them by two $\frac{1}{4}$ in. thick strips of wood at the edges. Hold the lot together with rubber bands, etc., and treat as one piece of glass.

Lay the glass over the negative end of the enlarger. A 100-watt electric lamp may then be used, placed a short distance away. A $4\frac{1}{4}$ in. enlarging condenser would give more speedy printing, but this would add to the expense and carry this enlarger beyond the simple model originally envisaged.

Focusing

The chief problem is to get correct focus and except by a lucky fluke, it is unlikely that this will be obtained at a first trial. The following is a simple yet effective way of testing.

Between the glasses of the negative holder, place one or two human hairs. Make up the enlarger so that one side can be taken off and do not fix the lensholding panel permanently, but arrange so that it can be moved back and forth a little. Fix a piece of white paper in the place where the photographic paper will finally come. With the aid of an electric lamp and opal glass, as just described, let light shine through the lens on to the paper.

It will greatly help if the electric light and the negative-to-lens part of the box are screened with a large cardboard carton, bits of blanket, etc., so that the only light that matters is cast, via the lens, on to the white paper.

At first, just a blob of light will appear, but if the lens board is racked to and fro, there will come a time when the hairs in the negative holder are seen to the best advantage, sharp and clear.

Of course, the paper-holder may also be temporarily fixed by means of, say, sticking plaster, so that it can, too, be moved. The slightest adjustment usually results in a contrast between a blurred enlargement and a sharp one. When the correct distances have been found, the various parts are fitted permanently together. (297)

Bed Lamp—(Continued from page 101)

as well as anything. This is practically self-explanatory. It is a piece of 1 in. thick hardwood, 6ins. long, and $1\frac{1}{2}$ ins. wide. At $1\frac{1}{2}$ ins. from the bottom, a hole to fit the diameter of the steel tube employed to make the bedstead frame is to be bored through, but before boring, drill a $\frac{1}{2}$ in. hole through, just above, and below, where the larger hole is to come.

These holes are bored at right-angles to the larger hole.

Now saw the wood strip into two $\frac{1}{2}$ in. ones, and cut one of these to 3ins. long, measuring from the bottom. Join both together with 2in. iron bolts, fitted with wing nuts. The upper half of the fitting is screwed to the door of the lamp box. The fitting then goes over the rail of the

bedstead, and is tightened with the bolts and nuts.

A 7ins. by 14ins. panel of $\frac{1}{4}$ in. fretwood will be ample for the box, and leave a handy piece over for another job. The thicker front can be cut from any suitable scrap of wood at hand. One pair of $\frac{1}{2}$ in. brass hinges will be required, and a pair of hook fasteners.

For any size of table it is essential to have A BILLIARDS MARKER

WETHER one plays billiards on a full-size table or on a simple home-made affair that rests on top of the dining-room table, a marking board is essential. The full-size board described below can be made with the simplest of tools.

The first step is to make up the main box framework, using wood 1in. wide by $\frac{1}{8}$ in. thick. This must be chamfered off for $\frac{1}{8}$ in. along the top edges, while a rebate $\frac{1}{8}$ in. wide by $\frac{1}{8}$ in. deep is worked along the bottom edge. In end-section the wood will then resemble Fig. 1.

Box Frame

Two strips 1ft. 6ins. long and two 6ins. long will be needed for the framework. The ends of these are cut down in a mitre box through the 1in. thickness so that they can be assembled into a box with outside dimensions of 1ft. 6ins. by 6ins.

This box must be glued together at the corners. If suitable mitre cramps are available these can be used to hold the corners until the glue has set. If not, a stout piece of cord should be passed round the outside of the box and firmly knotted. Two small blocks of wood can be put between the string and the moulding at each side, and when the joints have been glued these blocks are forced outwards towards the corners, thus bringing pressure to bear on the joints.

The box should be left in this improvised clamp until the glue has set hard, when two holes can be drilled through each joint with an archimedian drill, and some fine panel pins driven through these holes to make the corners secure.

Fancy Top

A pediment 8ins. long, $\frac{1}{8}$ in. wide and $\frac{1}{8}$ in. thick, is then made, this having a simple half-round shaping at each end (Fig. 2). Two small triangular brackets are fixed at the back of this, and by means of glue on the bottom edges of the fitment and screws driven through the brackets, the whole is fastened to the top

of the box. It is fixed so that it is midway along the length, and with its outer face flush with the outer surface of the box moulding.

There are two ways in which the front panel can be made.

The simpler method is to use a sheet of $\frac{3}{16}$ in. plywood measuring 1ft. 5 $\frac{1}{2}$ ins. long by 6ins. wide. Four slots, all 1ft. 3ins. long by $\frac{1}{8}$ in. wide, are sawn from this with a fretsaw, their position being shown in Fig. 3. The edges of these slots must be cleaned up with a chisel so that they are perfectly straight.

A less satisfactory method is to use five pieces of $\frac{1}{8}$ in. solid wood, two being $\frac{1}{8}$ in., two 1 $\frac{1}{8}$ ins. and one $\frac{1}{8}$ in. wide. These must be fitted into the rebates of the box so as to leave the $\frac{1}{8}$ in. wide spaces between their inside edges, thus matching-up with the plywood panel. A small strip $\frac{1}{8}$ in. long by $\frac{1}{8}$ in. wide must be glued between the strips at each end to close in the grooves (Fig. 4).

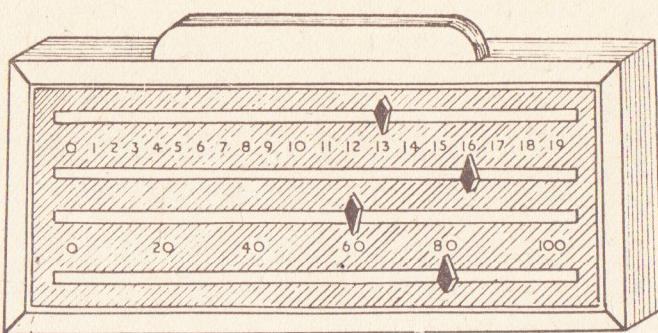
Whichever method is used for the panel, the completed item is put into the rebate of the main box and is held in place by a few picture-frame sprigs.

Markers

Four markers will be needed. The front of each is cut to a diamond shape from a piece of wood measuring $\frac{1}{8}$ in. long, $\frac{1}{8}$ in. high and $\frac{1}{8}$ in. thick. The measurements for the diamond are given at Fig. 5.

A strip of $\frac{1}{8}$ in. square wood is glued behind each marker, its edge being level with the widest part of the shaping, while its sides are shaped off flush with the sides of the markers (Fig. 6). Each marker in turn is put into place from the front of the panel, and a small piece of $\frac{1}{8}$ in. wood is glued to the back of it to hold it in place. Each marker should slide quite freely along its slot.

Three $\frac{1}{8}$ in. wide strips, 1ft. 5 $\frac{1}{2}$ ins. long, are then fixed at the back of the box, the



position of these being shown by dotted lines in Fig. 3. The ends of these strips must be supported on $\frac{1}{8}$ in. thick strips at the ends, the object being to prevent the front panel from being pushed in as the markers are slid along.

Backing

The board is completed by fastening a sheet of plywood or stout cardboard in the back, holding this in place with picture-frame sprigs. Fig. 7 gives a section through the completed box.

At this stage the box can be thoroughly cleaned up with glass-paper and be either stained or lacquered. 'Centre points' for the numbers should then be lightly marked in pencil on the front panel. These numbers can be painted on, if so desired. They are drawn in the appropriate places (as shown on the sketch of the finished article) and may be painted either black or white. A neater method, particularly if the worker is not a good draughtsman, is to use small-sized transfers or printed figures, taking care to line up the bottom of the figures.

These small transfers are not too easy to apply because of their size, and should in any case be coated with clear varnish afterwards to preserve their face.

If the woodwork has been stained, it can be finished with a light coating of wax polish, while a lacquered finish can be 'burnished' to a certain extent with a soft duster. To finish off the work, the markers that fit in the top and third grooves should each be marked with a small dab of white paint so that the 'spot' and 'plain' players each have their separate set of markers. (295)

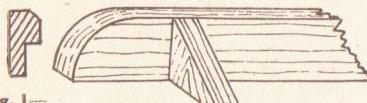


Fig. 1—
Frame
strip

Fig. 2—Back view of pediment

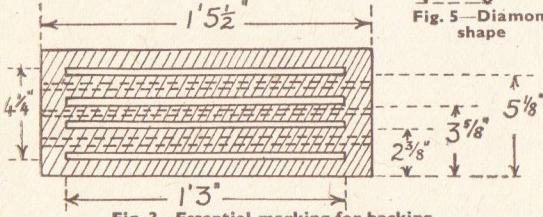


Fig. 3—Essential marking for backing

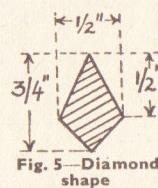


Fig. 5—Diamond
shape

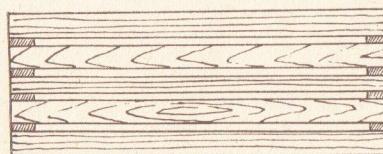


Fig. 4—Forming the marker grooves

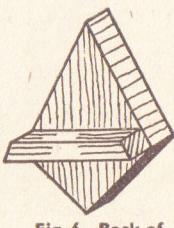


Fig. 6—Back of
marker



Fig. 7—
Section
of board

These gadgets cut out much labour as WASHING-DAY SAVERS

ANY time saved on washing-day is a blessing to the housewife and a chance for the handyman to show his ability in making suitable gadgets and labour-saving articles.

The ordinary clothes prop is not always so handy when it comes to various heights of line and shifting, perhaps, from one part of the garden to the other. One can make a very good extending one (Fig. 1) which can be adjusted from 1½ ins. by 1½ ins. wood, which is quite strong enough for this.

Prop Adjustment

Adjust your lengths so that you can use two sections and at the base of each drill some holes about 2ins. apart and ½ in. in diameter to take a long nut and bolt. As shown in the sketch you will see that the prop can then be fixed to suit you by adding other holes.

Props also have a habit of slipping from the line. Here again, make the prop from 1½ ins. square wood. Then 3ins. from base, drill a hole ½ in. diameter. Make a panel of 1in. wood about 8ins. by

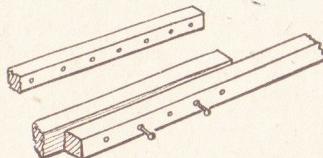


Fig. 1—A prop extension piece

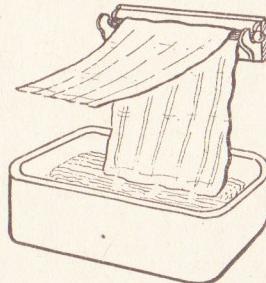


Fig. 4—A handy blanket holder

10ins., although the size is not all important as it only serves as an anchor.

Buy two ordinary flat angle brackets of 3in. length and screw these to the centre of board, leaving a gap so the prop can be moved backwards and forwards freely. Fix the prop on the brackets with a large nail or nut and bolt.

Woodturning—(Continued from page 100)

the hooked end projects beyond the tool-rest, giving support to the front of the cutting chisel.

A fruit or nut bowl always looks well in turned work. Suggested dimensions for a useful bowl are given at Fig. 8a, and the method of working is obvious. Such a bowl would look very well if carried out in walnut.

Space for drying small items is always a problem and yet 17ft. of airing space can be made over the cooker or gas range with the aid of our usual old stand-by, the dowel rod, which is now obtainable in all sizes.

One can make this arrangement, as seen in Fig. 2, with a toy wheel of soft wood about 6ins. in diameter. Failing this a disc cut with the fretsaw will do. Fix the wheel in the wood vice and drill holes round to take lengths of dowel about 15ins. long. Make sure you get them evenly spaced and also at the correct angle. You can do this by continuing the direction of drilling to the centre.

Glass-paper all the parts and drill a hole through the centre to take a length of ½ in. dowel. If you continue this through below the disc by 6ins. you can make a further one to hang underneath, provided space permits. This will double the airing space right away.

Driers

Wet washing days cause considerable inconvenience, especially in airing large items. Some people keep three lengths of 7ft. 1½ ins. by ¾ in. flat wood handy and this they use to put across from the backs of two kitchen chairs in front of the

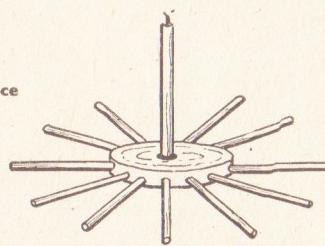


Fig. 2—A hanger for 'smalls'

fire. It is surprising how quickly these items will air this way and the idea is not so difficult as the hanging airer. In such cases, the wood must be well glass-papered and clean.

Space is a great bugbear where airing is concerned. Some domestic stores sell what is known as a 'Clothes Maiden' which is smaller than the normal airer. In case readers are not familiar with it they will soon get the idea of its shape from the drawing at Fig. 3 and no further details will be needed in its construction.

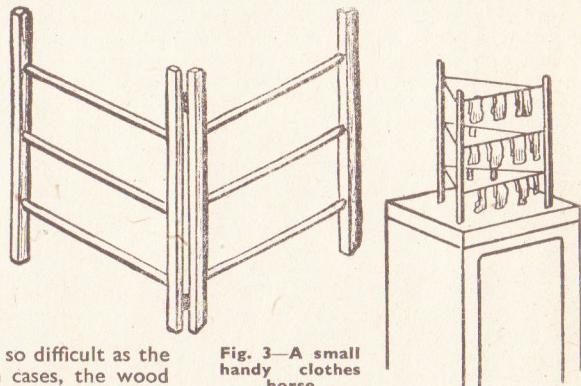


Fig. 3—A small handy clothes horse

that a handy shelf could be fitted. Leave ample room for the thick texture to go through. A removable roller would be best and this can be scrubbed clean each time as unlike the towel roller, considerable dye stain may come off and damage other articles. (267)

The only drawback to this bowl is that it must be worked in solid wood, with a great waste of material. Given sufficient panels of ½ in. or similar thickness wood, however, it is possible to make a laminated bowl. This would look particularly well if two contrasting woods were used. (Fig. 8c). You can use two varieties of wood in alternate

layers or vary each one right through.

With a fretsaw the centre could be cut out of each panel (leaving that piece of wood available for future use and also lightening the subsequent work of turning) and the pieces are glued above each other to gain the requisite height (Fig. 8b). The turning would then be done in the normal way. (262)

Books to Read!

A review of interesting books for craftsmen which have been recently published. Obtainable through newsagents or book-sellers or direct from the publishers mentioned.

Junior Science

by Stuart Miall

THIS is a new three-volume work which deserves a place in the home of every intelligent and thinking reader. It is of absorbing interest and lasting value, because it sets out in such simple way the fundamentals of science in its various phases. There are 70 chapters, running to 892 pages each one of which is illustrated with large, clear understandable diagrams or actual photographs. It covers Engineering, Astronomy, Mechanics, Physics, Chemistry, Mathematics and Natural Science and covers not only their elements and principles, but shows their practical application in everyday life. The pages and print are large and clear, and each volume is beautifully bound in embossed red cloth with gold blocking—so forming a worthwhile addition to the home bookshelves. Just the set of books for junior to persuade dad to buy, knowing they will both be intensely interested in its educational pages. A clear understanding of principles and practice is easily attained, whilst those definitely studying for school or university examinations will, undoubtedly, find all the information they need presented in concise, but helpful manner. The author, undoubtedly, knows his subject and the way to present it to prove fascinating reading. The free brochure offered by the Publishers should certainly be in the hands of all keen readers.

Published by The Caxton Publishing Co. Ltd., Clun House, Surrey Street, London, W.C.2—Price 85/6 in cash or 90/- on monthly payments.

Wood Finishing

by W. A. G. Bradman

ALL too often we find what would otherwise be an excellent piece of woodwork, is spoiled by the finish. For some reason amateurs will spend happy hours with carpentry tools in the construction of the article in hand, but will rush the last operation of finishing, and literally spoil the whole thing. This applies to painted toys, to coloured models, and to home carpentry articles. It should never be—particularly when there are such helpful books as this to help out. The author has experience to help him and is able to convey his knowledge so any amateur can follow. The processes of finishing are not speedy—and, perhaps, it is this urgency which results in bad completion. At the same time a really good piece of work demands a good ending, and there is nothing more beautiful than a well-finished article in wood. The whole

technique of staining, polishing, varnishing, french polishing, and the more modern spraying are dealt with in a thorough and helpful manner.

Published by W. & G. Foyle Ltd., Charing Cross Road, London, W.C.2—Price 2/6

Practical Upholstery

by Charles H. Hayward

THERE are few who have been in possession of a home long, who have not required the services of an upholsterer, and many is the piece of furniture discarded because it requires this attention and never gets it. The work of course, is a specialized trade, but with a book such as this, there is every possibility of the average home handyman being able to do his own repairs and general upholstery work. It is worth it, too, when professional repair and material are so costly. At least a trial can be made on the wanted job, and a fascination and pleasure can be found quite easily in the work. This excellent book is written by a practical man with years of experience and in its clear-type pages, diagrams and photographs, every need is covered, concisely and easily, whether for amateur or professional. Whether you want to cover a slipper box or a settee, the book tells you how.

Published by Evans Brothers Ltd., Russell Square, London, W.C.1—Price 7/6

The Railways of Britain

by W. H. Boulton

WHETHER you are a railway fan or not, you will find this book immensely interesting, with its fascinating story and factual coverage of the

systems of railroad from their introduction in 1825. The story is built up as various early lines were laid down in the different districts. There are chapters of the old provincial systems of 120 companies and their amalgamation into four after the 1914-18 war and final conversion into the monopoly of British Railways. The vast organisation of a railway is explained, the ancillary business of docks, canals, road and air transport, the tubes and electrification, post office mails, etc., are all dealt with by an author whose lifetime of service and ability to write provide a story worth reading and a book worth keeping. The book itself is beautifully produced on art paper with clear photographs and large type covering 384 pages. As a book of reference it is invaluable, as a railway story it is delightful.

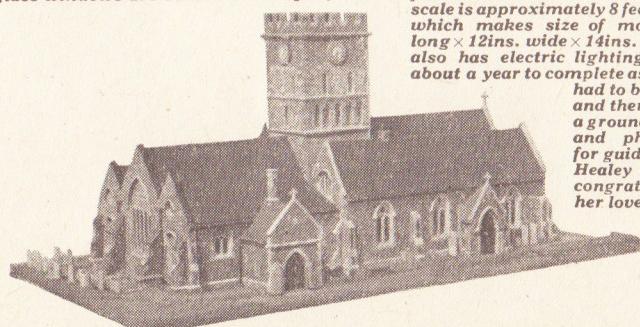
Published by Sampson Low, Marston & Co. Ltd., 25 Gilbert Street, Oxford Street, London, W.1—Price 21/-

The Legend of Aladdin

THIS is certainly more than a book because it not only tells the story, but provides colour card cut-outs so you can build a model miniature theatre, with colourful scenery, figures, backcloths and effects. Many of our readers will make the whole thing more permanent and usable by mounting the card on thin wood and cutting out the parts with a fretsaw. The construction of the little model is straightforward, and when complete can be used as a puppet show with the story, dialogue, and even musical score provided. This new pro-

An Attractive Architectural Model

OUR readers are always bursting out in original places, and here is another instance of realism and ingenuity. This 20in. model is a replica of St. Laurence-in-Thanet Church, a real gem of English architecture, built nearly 900 years ago. The builder was Miss E. Healey of Grange Road, Ramsgate, who had it on show recently at the local Model Club Exhibition. The model is made entirely by hand, of plywood of varying thicknesses, and the flint and stonework painted on. The stained glass windows are done with Perspex, and are painted in colour at the back. The scale is approximately 8 feet to 1 inch, which makes size of model 20ins. long x 12ins. wide x 14ins. high. It also has electric lighting and took about a year to complete as drawings had to be prepared and there was only a ground floor plan and photographs for guidance. Miss Healey is to be congratulated on her lovely work.



duction is sure to be as popular and successful as its predecessors in the same series.

Published by Medallion Press Ltd., 5 Dowgate Hill, Cannon Street, London, E.C.4—Price 3/-

Table Games

by Ray Marran

ALREADY we are beginning to wonder what we shall do at Christmas and hoping the time will not 'hang' for want of something to do. Readers of *Hobbies Weekly* will find plenty of suggestions to prevent such a situation and this book should be also borne in mind for certain occasions. These games are almost all confined to the simple card type of 'snakes and ladders' or 'ludo', but have a wide range of novelty and interest for lasting amusement. There are for instance 12 varieties of tiddley-wink games, nine checkerboard games, and an amazing range of spinning, counter and running games. There are altogether 60 to choose from, all played with simple board bases, spinners, counters, etc., the production of which is plainly told at the beginning of each section. Get the book now, and you will ensure peace and

happiness for many moments, either when the party begins to flag or your own interest wants a change.

Published by Nicholas Kaye Ltd., 1 Trebeck Street, London, W.1—Price 6/-

Motor Cars, Railways, Ships and Aeroplanes

THE comfort, speed and science of modern transport by air, sea, road or rail cannot surely have been put into any book more completely, more lucidly and in a more interesting manner than this latest book of the well known series. There are over 300 illustrations in its 384 pages and the features cover all the latest developments introduced into the various services dealt with. Apart from the excellent photographic pictures there are dozens of drawings with cut-away how-it-works details which clearly illustrate many of those intriguing processes about which the average reader has so often wondered. Jet, rocket, diesel, radar are all up-to-the-minute processes introduced into modern travel and here you find how they serve. Altogether a fascinating book to read—and one to pick up at any time again and again to learn a little bit more.

Published by the Book Dept., Odhams Press Ltd., Long Acre, London, W.C.2—Price 8/6

Handtools for Wood and Metal Work

by R. Harries

TOO frequently the handyman treats his tools with casual disregard and forgets they are the real asset to his hobby or work. Too often they are used without proper knowledge, and allowed to become unkempt and uncared for through lack of interest. Tools are valuable for the excellent work they produce and a book such as this shows you really how to use them to get full value. Even though you do not possess all those dealt with, every reader will have many of them, and a perusal of the details will prove what better service he can obtain by a more thorough knowledge of their use, care, and repair. Such common subjects as rust, space, storage, edges, etc., troubles we all encounter, and how to deal with them is one of the many things worth knowing and sufficiently dealt with in this book.

Published by G. Bell & Sons Ltd., York House, Portugal Street, London, W.C.2—Price 5/-

Plywood, battens, hinges and paint easily converted into A LIGHT EASEL

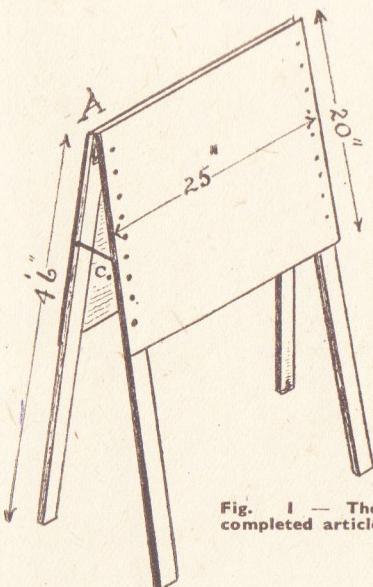


Fig. 1 — The completed article

USEFUL toys these days are costly items, and many of the dear ones are not made for long intervals. To suit a child of seven to ten years, and at a cost of only a few shillings, you can construct this light easel and blackboard, which will show no signs of collapse after three years' hard wear.

To make the model you will require four battens of white deal each 4ft. 6ins. by 1½ins. by 3in. for the legs, two sheets of 3-plywood 25ins. by 20ins., three

dozen ½in. round-head wood screws, two 6in. gate-hooks, two 1in. hinges, and a quarter of a pint of Ripolin black paint.

You should begin by making the legs from the four battens. Mark these out, saw to required length, plane up the faces, and test them with the try-square. Then fix the two 1in. hinges in position to make two pairs of joined battens, as seen at (A) in the diagram. The perspective view in Fig. 1 shows how easily this can be done, whilst a detail of the hinge is given at Fig. 2.

Plywood Boards

Now you can turn to the plywood sheets. Draw a pencil margin of 1½ins. down each of the 20in. sides, and set out nine clear pencil points at 2in. intervals in the centres of these marginal spaces. Then with a small drill make the eighteen holes in each sheet of plywood. Now screw one sheet into position on each pair of the joined legs.

Support the other temporarily in a horizontal position by fixing four of the screws, one at each marginal hole in the sheet, into four blocks of scrap wood. With a two-knot distemper brush apply three even coats of the Ripolin black to the surface of this sheet of plywood. Remember that one coat of Ripolin black must be thoroughly dry before another is attempted.

This blackboard, which is so serviceable for coloured as well as white chalks, can be screwed into position on the other two legs. Here is a useful hint, by the way, about this blackboard. A slightly moistened cloth is better than a dry one

to remove the first chalk marks from this surface.

The model is now ready to be stationed with the two 6in. gate hooks. Fig. 3 shows how the gate hook is fixed, and a useful guide for the position of the screw and eye is the sixth marginal head screw on the plywood sheet.

Put the gate-hooks into position and then notice how the fixed angle between the boards of the easel has lifted the right-angled feet of the legs from the floor. You can correct this by sawing

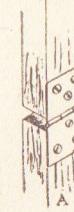


Fig. 2—The hinge fitting

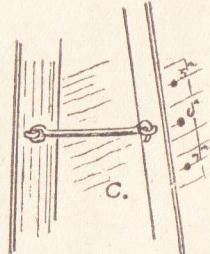


Fig. 3—The fixing hook

through the nearest bottom of each leg parallel to the surface of the floor.

To give the easel a nice finish you could brush all the woodwork except the blackboard, in green enamel paint. When the easel is finished the child can either sit or stand to paint and draw. Papers for painting are fixed to the green painted plywood sheet with drawing pins, and wet work can always be conveniently left to dry. The board is thus handy and always usable.

Additional pleasure is obtained in photographing by HOME PROCESSING

HAS it ever occurred to you what an enormous number of cameras are in use during the summer months? It is some years since any figures were given and even then it ran into some millions. That may sound an exaggeration to some folks, but those who are in a position to ascertain fairly accurately, have reckoned that there is a camera of some sort in every family in Great Britain. In some, probably three

The Whole Process

Doing your own processing is, in the minds of all advanced and enthusiastic amateur photographers, essential if you wish to achieve success with your hobby. By processing is meant the 'bringing out' in the portion of film and on a piece of paper the result of the action of light when you made the exposure. In other words developing the film to produce a negative and, also, the piece of paper to produce a positive print.



A striking composition for the album

or four could be found and it also follows that there are some where no camera could be found.

Let us leave cameras and try to get some idea how many films have been exposed during the last 12 months. Somewhat bewildering isn't it? Hardly know how to start making the calculation. One can only estimate very roughly the number of spools the average amateur uses, and it is generally admitted that the great majority of cameras are only taken out during the two or three weeks holiday or on bank holidays and other special occasions.

Well you will be somewhere near a correct solution if you allow an average of three spools per camera and 10 exposures per spool. Yes, there must be a colossal number of negatives about!

Storage of Negatives

How many good negatives have you secured this season? Where are they and how do you keep them? These are questions which should receive some consideration. And if you cannot give a satisfactory answer to the last query, then we would urge you to collect all negatives, sort out the good from the bad and indifferent and place them in separate bags or envelopes for the time being.

In the near future we hope to print an article on Filing or Storing Negatives, a system by which any one negative can be found in less than a couple of minutes. If you are interested in becoming a practical photographer you will be well advised to look out for the article and meantime get those negatives together and in a dry and safe spot.

If you were to ask a keen amateur why he does this work, he will tell you it is the most interesting branch of the hobby. The initial work of exposing a film is only a first step. It is in the darkroom where the real work of picture-making is done and where one gains experience most valuable to him.

After many years experience the writer is convinced that verdict is correct. The best photography, pictorially and technically, is produced by those who understand, and can by their own skill, carry through the whole process of picture-making from exposure of the film to the mounting of the finished print.

If you are really keen and wish to make the best use of your hobby, why not make a start now? Do not harbour the idea that it is expensive, messy or requires a lot of room. Obviously one cannot run any hobby without spending a little cash on it, and you who own a camera, you have already incurred what is likely to be the heaviest outlay for a long time to come.

Each time you take a spool to be developed and printed by the local

chemist it has made a hole in the pocket money, and, what is much more to the point, you have not had the extra pleasure which those derive from the hobby who 'do their own work'.

Where to Work

Now let us tackle the question of room. You will, perhaps, remember the article on Tank Development which appeared in the issue of *Hobbies Weekly* of January 18th this year. In that you were very definitely shown that a darkroom is not necessary for developing films. Neither is it for the development of Contact (Gaslight) or Bromide printing papers.

A darkened room, yes. But the kitchen, bathroom or even the dining room can be made this by simply switching off the light. Why should the work be messy? One has to use chemical solutions but it is up to the operator to use a moderate amount of care, and a newspaper spread over the table or floor will stop any drops of solution that are accidentally allowed to escape from the dish staining the carpet.

If the work is done in the bathroom one need only put a few inches of water in the bottom of the bath as a means of preventing any mess. It follows that if it is possible to turn a loft or a roomy staircase or other cupboard or even a small lumber room into your very own photographic den, then you are in clover. For then you have a place in which to keep all the apparatus and kit together. This can be all easily stored in a wooden box 18ins. by 15ins. by 12ins.



Light and shade on boats

such a box has been the writer's store cupboard for years.

To turn the bathroom into an effective place for the work it is necessary to exclude all daylight and usually a blind of opaque material will do this. If your work is a winter evening occupation, then the blind is not wanted.

We come now to the matter of apparatus. This is, of course, an initial charge and one that cannot be avoided, but with care each piece will last for years. It is almost impossible to give

present day prices of the articles but a visit to your local photographic dealer will soon prove that the outlay is not likely to be very excessive and it will give you the opportunity to select according to your choice.

Apparatus Needed

Here is a list of the necessary pieces:—two (three if you can manage it) deep dishes, 6½ ins. by 4½ ins.; one 10oz. and one 2oz. measure; one printing frame, size to take your films, complete with a piece of glass; one darkroom lamp fitted with orange and ruby glass. You can make a start with this set and there is no need to increase it unless it is your intention to make up a particular formula for the processing; in that case a small set of scales and weights will be wanted.

While on the question of apparatus, let us remind you that an ordinary glass tumbler holds 10ozs. (½pt.) of water and a tablespoon holds 1oz., dessertspoon ½oz. and a teaspoon ¼oz. of liquid (approx.).

Chemicals

It is a mistake for any beginner to lumber himself with a lot of bottles of chemicals. It is not chemical research that you intend doing and they are not necessary. Therefore, you are well advised to use the ready prepared powders or solutions, such as Johnson's Pactum Metol-Quinol developer which are obtainable everywhere. The other chemicals required are a ½lb. tin of acid-fixing powder and we would suggest a 1oz. bottle of potass. metabisulphite. If you specially desire to make up a formula, then only purchase the smallest bottle of each of the ingredients.

The last item is the printing paper. There are, as already mentioned, two types—Contact and Bromide. But there are numerous varieties of each of these, different surfaces, grades and speeds, and there are several makers.

Standardizing

It is well not to allow yourself to be confused with the variety. Start with one of a well known make of a glossy or matt surface whichever you prefer and of a normal grade. Papers are sold in packets of all the standard sizes and no difficulty should be experienced in purchasing paper to fit your films.

In order to avoid wasting time and paper by guess work or expensive tests it is very advisable to sort the negatives you intend to print into at least three groups—dense, medium and thin. Once you have ascertained the correct exposure required for any one of the groups it will help to give that for the others.

This sorting is a first step towards what might be termed 'standardising'. The light by which exposures will be made is standard, the developing solution is also standard and so is the paper. Now there is only one other detail, and that is the distance between the printing frame and the light by which the exposure is to be made and this can be 'standardised' at 12ins. Although it is only possible to give approximate exposure times, it may be of help to have these by you for reference.

Assuming that a normal grade of contact paper is in use and one of the normal or average density group of negatives, the exposure with a 40 watt electric lamp would be about 6 seconds, the same for incandescent gas and, say, 30 seconds for a duplex paraffin lamp.

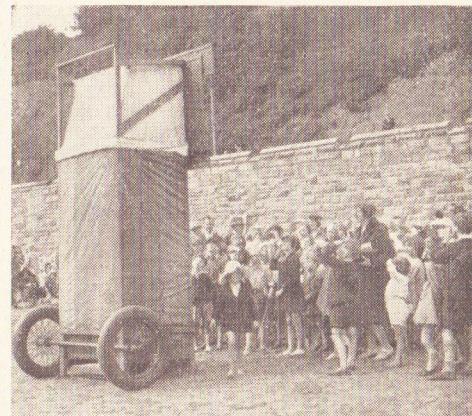
The Pactum Metol-Quinol makes up to 4ozs. of developer for contact paper. That is sufficient to develop about 40 pieces of 3½ ins. by 2½ ins. paper if you can complete this number of prints in one evening. To make the fixing bath take 2ozs. of the acid-fixing and dissolve it in 30ozs. of water. If a smaller quantity is desired, then keep to this proportion. In any case the solution keeps almost indefinitely if stored in a well corked bottle, but do not use to exhaustion.

Paper Economy

In order to prevent waste it is necessary to avoid all haphazard work and in this respect guessing at the exposure required for any negative is bad practice until some experience has been gained. So commence operations by selecting an average negative, place it in the frame with a sheet of the paper laid face downwards on the film side of the negative. This must be done with the orange light on.

Stand the frame 12ins. from the lamp and expose for 6 seconds. Switch off the light and cover about one-third of the framed negative with a piece of card. Then expose the rest for a further 3 seconds and cover up with the card two-thirds of the film. Give a final 3 seconds to the section of the film that has not been covered by the card.

You will recognise that on that one piece of paper there are three ex-



A popular Beach Scene

posures and when this test strip is developed it should indicate which time is correct or nearest. Place the paper in a dish with the emulsion side up and pour the developer carefully, without making any air-bells, completely over the paper. Development takes from about ½ to 1½ minutes, but if the outline of the image does not appear in, say, 30 seconds, the print is under-exposed. If it flashes up and goes black immediately it is a case of over-exposure, but that test should give you a very good idea what is wanted to make a good print from that negative.

Three Dishes

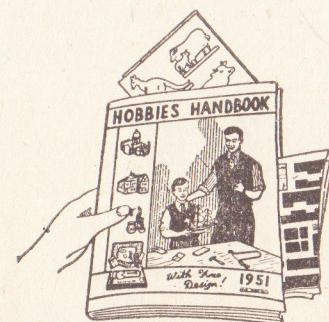
You will remember we suggested three dishes are desirable. One is for developing, another for the fixing and the third for a 'stop' bath. This last is prepared by dissolving 1oz. of potass. metabisulphite in 20ozs. of water, a solution which keeps indefinitely. It is for use as follows.

When the print is developed, plunge it quickly into this 'stop' bath before placing it in the fixing bath. Leave it there for about 3 minutes and then put it in the fixing bath and leave it there for 15 minutes. Then wash it in running water for ½ hour or in four changes and it is ready to dry.

The great advantage to be gained by the use of the 'stop' bath is that its action kills any further action of the developer and thus prevents brown stains occurring on the print. If you do not make use of the 'stop' bath, then be sure to place the print into the fixing bath immediately it is taken from the developer, otherwise stains may arise. The white light can be turned on when the print has been in the fixing bath 5 minutes.

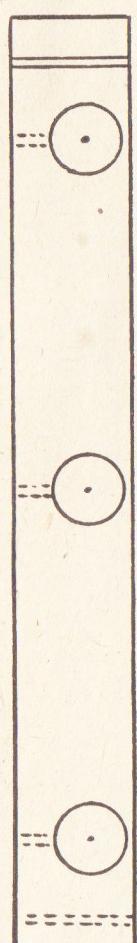
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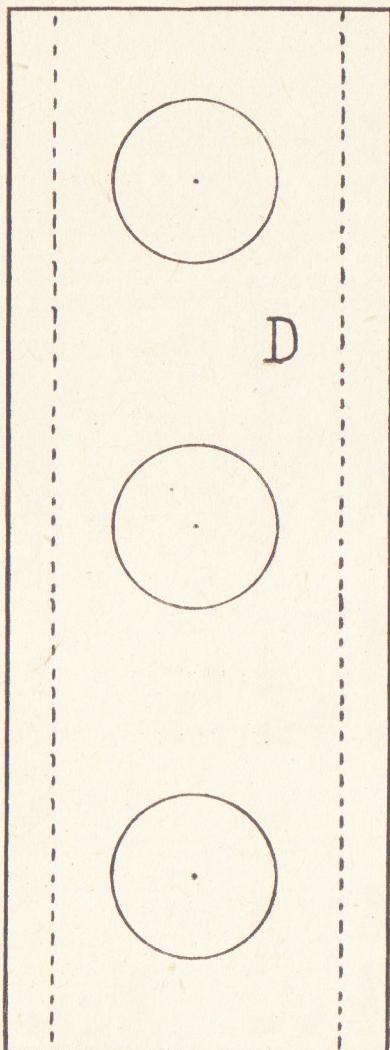


Patterns for Traffic Indicator

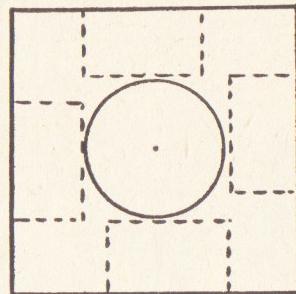
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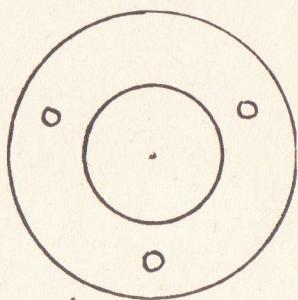
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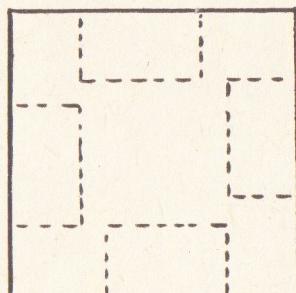
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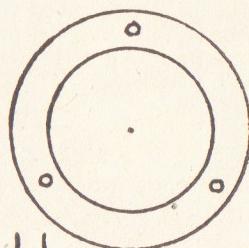
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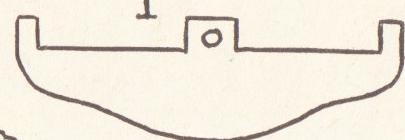
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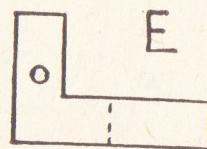
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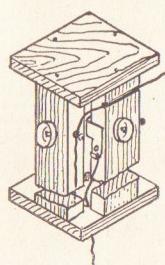


Fig. 1—The lamp box

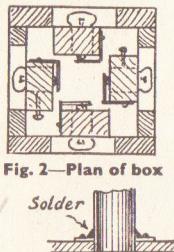


Fig. 2—Plan of box

Solder

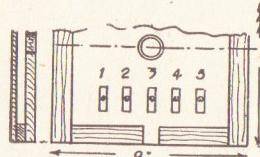


Fig. 4—The baseboard

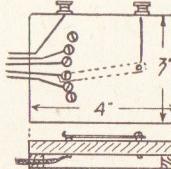


Fig. 5—Baseboard plan and section

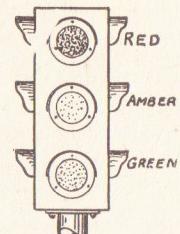


Fig. 6—Lamp colours

soldered to one of the terminals, and a wire is soldered to the remaining terminal and switch screw. These connections are indicated by thick black lines in Fig. 5.

A cycle lamp battery may suit for the model, and if the question arises as to why this battery cannot be accommodated inside the switch board, the answer is it can, but is really better

outside. If enclosed, there will be a constant temptation to friends and relatives to switch on the lights when they pass the model and the battery will not last so long.

The sequence of the lights is as follows looking at the N. face.

Stud 1. Red (STOP). W. and E. faces green.

Stud 2. Red and amber (GET READY).

W. and E. faces amber.
Stud 3. Green (GO). W. and E. faces red.

Stud 4. Amber. W. and E. faces red and amber.

In some traffic indicators the words STOP, etc., are printed on the coloured spectacles, but not always so. Readers can, therefore, use their discretion in the matter.

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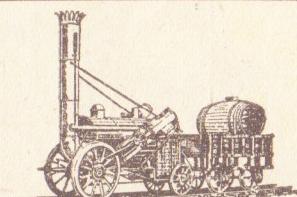
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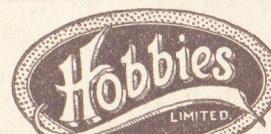
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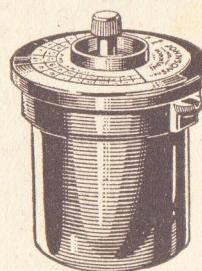
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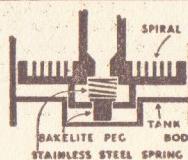
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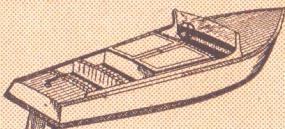
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